

the cartilage that is usually found below the seventh rib being fully developed into a rib." This description is somewhat ambiguous, but I presume it refers to the occasional elongation of the eighth costal cartilage in man, and its direct articulation with the sternum. At the time when I read this notice I was organizing a system of "collective investigation" in my class of practical anatomy, in Trinity College, Dublin, and I asked Mr. O. L. Robinson, one of my assistant demonstrators, to undertake the investigation of this point. During the last two months he has examined thirty subjects, and he has found the eighth costal cartilage united to the sternum in no less than five of these. In four subjects (two males and two females) the eighth cartilage of the right side alone showed this condition; in the remaining case (a male) the eighth cartilage on each side reached the breast-bone and articulated with its fellow in front of the upper part of the ziphi-sternum. The anomaly is therefore one of some frequency, seeing that it has been noted by Mr. Robinson in about 17 per cent. of the subjects which he has examined. I may mention that all the specimens are now in my possession.

But my object in making this communication is not so much to record the results obtained by Mr. Robinson, seeing that these will be more fully dealt with elsewhere, as to call attention to a remarkable statement which is made by NATURE on the authority of *Science*. It runs as follows:—"Dr. Lamb has made a thorough search of anatomical literature for references to this peculiarity. In the English books there is only a single incidental reference to it, and in that case the author does not say that he has ever seen a specimen. In German books there are two references, one of them being the one mentioned by the English authority." Certainly this is not my experience of the literature on this subject. There is hardly a German text-book of importance in which the anomaly is not referred to.¹ Thus Gegenbaur, Aebly, Luschka, and Henle, all mention it, and the two last enter into the question at some length. Henle likewise quotes the observations which have been made upon this point by Hyrtl and Prof. Oehl of Pavia. It is true that our own text-books are for the most part silent on the subject, but Prof. Humphry in his classical work on the human skeleton, p. 323, remarks: "In a specimen in the Cambridge Museum, which measures seven inches, there are eight cartilages of ribs separately united to the sternum." This is not the description of a man who has never seen such a specimen.

It is interesting to note that, of the ten cases recorded by Dr. Lamb, nine occurred in Negroes and one in an Indian. Luschka, referring to the assertion that the anomaly is more frequently observed in black races, says: "Im Verlaufe weiterer Nachforschungen hat es sich jedoch herausgestellt, dass bei den Negeren nicht häufiger als bei anderen Menschenstämmen und immerhin nur in Ausnahmefällen acht Rippenpaare an das Brustbein angeheftet sind" ("Die Anatomie der Brust," 1863, p. 119).

Another feature of interest in connection with this anomaly is centred in the fact that in the lower apes, and also in the chimpanzee, it is the typical condition. As a rule, they present eight true ribs on each side. The orang, however, resembles man in this respect, and normally possesses only seven true ribs. Curiously enough, the transition stage between man and the orang on the one hand, and the chimpanzee on the other, is to be found in the gibbon. In this ape, so far as my experience goes, the cartilage of the eighth rib, although it is long and rests by its tip against the ziphi-sternum, does not articulate with the sternum. A condition similar to this is occasionally seen in man.

D. J. CUNNINGHAM.

Trinity College, Dublin, January 2.

"The Cremation of the Dead."

In your excellent article on the above subject (p. 219), it is stated that a provision contained in the will of a testator directing the cremation of his remains has no legal effect. This is no doubt correct, for, although the law permits a man to dispose of his property by will, it does not permit him to dispose of his own corpse.

This legal difficulty may, however, be surmounted by an indirect method. Most testators bequeath legacies to their executors, and also to their nearest relatives; and the legacies bequeathed

¹ It is not referred to by Krause, Hermann Meyer, or Pansch, but in these books, as in our English text-books, the omission is evidently due to want of space and not to want of knowledge.

to the latter are not unfrequently of considerable value, even when the testator is a man of only moderate means. If, therefore, each of the legacies are made conditional upon the legatee taking, or concurring in taking, the necessary steps to procure the cremation of the testator's remains, the wishes of the latter would in the majority of cases be carried into effect; since any attempt on the part of a legatee to interpose any obstacle would involve the forfeiture of his legacy.

A. B. BASSET.

Conservative Club, S.W., January 6.

"Degradation" of Energy.

It may perhaps have occurred to others besides myself that the term "degradation"—as applied to the transmutation, for instance, of mechanical energy into heat energy—is a rather stronger one than our present knowledge warrants us in using: that it casts, in fact, an unmerited slur on the character of that eminently respectable concept, energy. We seem hardly justified in supposing that any *intrinsic* deterioration of the energy takes place in such transmutations as the above.

Might not "depreciation" be a rather preferable expression? This would imply nothing more than a lowering in the value of energy in relation to the particular needs and mere agencies of man, and not any absolute change in its character for the worse.

Similarly, money securities are said to be "depreciated" in a particular market, while they may not be at all lessened in absolute value.

H. G. MADAN.

Eton College.

Hares Swimming.

IN *Chatterbox* of May 12, 1879, published by Wells Gardner, Paternoster Buildings, is an account by J. G. Fennell of several instances in which he has seen hares swim across both fresh and salt waters.

OCTS. DEACON.

Loughton, Essex, January 5.

THE RECENT SOLAR ECLIPSE.

WITHIN the next few days we may expect detailed news of the various parties organized to observe the eclipse of January 1. In the meantime, the following telegram from Mr. Pickering, chief of the Harvard Eclipse Expedition, who was at Willow, California, will be read with interest:—

"The sky was clear during the whole of totality. The corona was larger and more irregularly shaped than usual, exhibiting great detail in its filaments. Three of the geometric contacts were observed. The duration of totality was 118 seconds, or three seconds longer than had been predicted.

"Capital drawings were obtained of the whole corona. Eight negatives were obtained with a 13-inch refracting telescope, and six with an 8-inch telescope, and seven photometric observations were made of the corona's light. The drawings show the corona extending outwards from the sun for two of its diameters—that is, 2,000,000 miles in both directions. The corona somewhat resembled that of the eclipse in July 1878."

Another account of the doings of Prof. Pickering's party states as follows:—

"During yesterday's eclipse of the sun twenty-five negatives were taken at Willow, California, to measure the brightness of the corona and its surroundings. Five of these were obtained to search for intra-Mercurial planets, and twenty to study the spectrum of the corona in order to determine its composition. These negatives will reach from the yellow rays to the extreme ultra-violet.

"The general illumination during the period of totality was found to be lighter than during the eclipses of 1878 and 1886. The corona was similar to those of 1868 and 1878, but showed much more detail than the latter, and was exceptionally fine, extending usually on one side to two solar diameters. A striking characteristic was two forked wings of light. The polar rays were well defined and con-

siderably shorter. At Cloverdale, the eclipse was observed with great accuracy, but shortly before totality some cirrus clouds passed over, all tinged with the most brilliant colours of the rainbow.

"Venus appeared during the early stages of the eclipse, while Mercury and the other planets were plainly in view during every phase that was photographed.

"At Willow, the temperature dropped 7°, but the fluctuations of the barometer were quite imperceptible. The velocity of the wind diminished at first, but afterwards increased."

Prof. Todd secured a number of fine photographs of the corona, showing, according to Reuter's telegram, rays extending 10° or 12° from the sun.

At Winnemucca, the United States Signal Service observers made drawings of the streamers of the corona, and also took successful photographs. They saw the edge of the moon projected against the corona for some time after the total phase had passed.

At Lick Observatory, the eclipse was successfully observed, and a number of photographs were taken.

At Norman, California, the fourth contact was observed, but the first was lost in clouds. The moon's limb was not seen projected on the corona either after or before totality, although careful search was made. The telescope was used for making drawings of the corona adjacent to the sun's poles, and the sketches show very complex filaments. The negatives taken are excellent, and show the corona very similar to that seen in 1878. Long streamers were readily traced through 4°.

The party of observation at Bartlett Springs report that the corona was beautifully distinct, and that they saw remarkable changes in the length of the coronal lines. They obtained nine photographs of all contacts, studied the structure of the inner corona, and made measures of light intensity during totality.

Four long streamers were seen proceeding from the prominences, and the chromosphere was strong for a full quadrant distance of the west side of the sun. The northern and southern limbs of the sun showed a great number of fine radiating filaments.

At Chicago, a beautiful view of the corona was obtained. Two long streamers pointed nearly west, and two shorter ones were almost opposite. At the beginning of totality intense red flames burst out on the sun's western side, covering a space of 90°. The inner corona presented a beautiful spectacle in the telescope. Its radiating filamentary structure, with both curved and straight lines, was distinctly seen.

At Healdsburg, although only nineteen-twentieths of the sun's surface were obscured, Venus, Mars, Jupiter, Mercury, and the principal fixed stars were visible. The corona also appeared with long rays of light parallel to the sun's equator.

Mr. Swift, Director of the Warner Observatory, stationed at Nelson, California, reports that, as far as it afforded an opportune search for an intra-Mercurial planet, the eclipse was a failure, owing to clouds and haze.

At Anaheim, no photographs were secured, but it is claimed that an intra-Mercurial planet was seen during the period of greatest obscuration.

At Winnemucca, Nevada, one observer discovered a comet near the sun. No appreciable change of temperature was noticed at this station. Accurate observations were also made of the shadow bands. The corona was similar in general appearance to that of 1878. The streamers extended to a distance of from three to four diameters, and the red protuberances were strongly marked.

At Grass Valley, during the period of totality, the stars and large planets were seen with the naked eye, and the corona and protuberances offered a grand spectacle. The thermometer fell 7° between the moment of first contact and totality. At Virginia City, Nevada

Territory, the thermometer fell 10° during the progress of the eclipse.

At Blackfoot, Idaho, all four contacts were observed. A short time before totality the moon's limb was seen projected against the corona. The mercury fell 13°.

From the above accounts it is quite clear that new information touching many important points has been secured. This is most fortunate, for the eclipse occurred at a well-marked minimum of solar spots; indeed, it was as marked as that of 1878, when again the eclipse swept over the American continent and was most fully observed.

There seems no doubt that the expansion of the sun's surroundings in the plane of its equator, dwelt upon strongly by Newcomb in his account of the eclipse of 1878, has been re-observed. We read that this ring was seen to extend some 2,000,000 miles on either side of the sun, and to put on the appearance of two forked wings of light. Not only in 1878 was this ring-like extension well marked, but, in consequence of the extreme quietude of the sun's atmosphere at the time, the exquisite structure of the atmosphere over each pole was one of the most striking features of the eclipse. The appearance was produced by the structure of the coronas bending gracefully over from the sun's axis prolonged, that nearest the pole bending least. This or something very like it has evidently been again seen, and the photographs which have been taken by Mr. Pickering's and other parties will evidently give a good account of them.

It must be noted, too, that the American astronomers have, as might have been expected, used large telescopes. We read of 13 inch and 8 inch refractors. Nothing so large as this has ever been employed before in eclipse expeditions, but then the parties this time have not been far from their base. In one of the telegrams it is stated that Mr. Pickering's party secured twenty spectrum photographs of the corona. This, perhaps, is the best news of all; and we read, too, that the less refrangible end of the spectrum has not been neglected.

Considering the short duration of totality, the results secured reflect the highest credit upon the organizers of the parties and upon the individual observers.

RECENT WORKS ON ALGÆ.¹

PROF. ASKENASY tells us, in a brief preface, that the Algæ collected during the voyage of the Scientific Expedition in the *Gazelle* were intrusted to him for examination, and that in the work he was assisted by Herr Moebius, by whom the greater part of the excellent figures in the plates were drawn. The remainder of the figures, with the exception of those in Plate I., were drawn by the editor, thus affording an apt illustration of the great advantage to naturalists of acquiring facility in drawing.

In the determination of the Algæ, Dr. Askenasy had the assistance of MM. Bornet and Hariot; the Characeæ and Conjugatæ were described by Dr. Otto Nordstedt, by whom the well-drawn figures in Plate I. were executed. Herr Grunow described the Cystophyllum and Carpophyllum, and the difficult genus of Sargassum.

The only new plant among the Conserveæ is *Anadyomene reticulata*, Askenasy, from the Island of Dirk Hartog, in West Australia. The Characeæ, now included among Algæ, are rather numerous; among them are two new species of Nitella.

¹ "Forschungsreise S.M.S. *Gazelle*," iv. Theil-Botanik. Algen; mit Unterstützung der Herren E. Bornet, A. Grunow, P. Hariot, M. Moebius, O. Nordstedt. Bearbeitet von Prof. Dr. E. Askenasy. Mit 12 Tafeln. (Berlin: Ernst Siegfried Mittler und Sohn, 1888.)

"Om structuren hos Champia och Lomentaria," med anledning af nyare tydningar. Af L. G. Agardh, Översigt af Kongl. Vetenskaps-Akademiens Förhandlingar, 1888, No. 2. (Stockholm.)

"Fresh-water Algæ collected by Dr. Berggren in New Zealand and Australia." By Otto Nordstedt. With 7 Plates. Communicated to the Royal Swedish Academy of Science, June 1887. (Stockholm, 1888.)